MATERIAL SAFETY DATA SHEET

Manufacturer Information

Company: SANYO GS Soft Energy Co., Ltd.
Address: 5 Ichinodan-cho, Shinden, Kisshoin, Minami-ku, Kyoto 601-8397, JAPAN
Prepared by: Quality Assurance Department
Quality Assurance Section
Phone: +81-75-311-1326
FAX: +81-75-311-1583

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Reference No. QAS0001F

1. Product name
(Chemical name, brand name, etc.)

Li-ion Battery

2. Material identification

Positive Electrode: Lithium cobalt di-oxide (LiCoO2)

Negative Electrode: Graphite

Electrolyte: Organic solvent (e.g., carbonic acid ester) and lithium hexafluorophosphate

CAS No. : Not specified

UN Classification number: Class 9 3090

However, since it corresponds to special provision A45 of IATA-DGR, this battery can be conveyed normally.

3. Hazardous nature/properties

Classification: Not applicable.

During normal use, there is no physical & chemical danger.

Human health effects:

- Inhalation: The steam of the electrolyte stimulates the respiratory tract. Moreover, if heated strongly by the surrounded fire, gas may be emitted and irritated eyes, nose, and throat.

- Skin contact: The steam of the electrolyte stimulates skin. The electrolyte skin contact causes the sore and stimulation on the skin.

- Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte skin contact causes the sore and stimulation on the eye. Especially, It may be caused the strong inflammation of the eye.

Environmental effects: Since batteries remain in the environment, do not throw out it into the environment.

Specific hazards: If the electrolyte contact with water, it will generate detrimental hydrogen fluoride.

Since the leaked electrolyte is inflammable liquid, it does not bring close to fire.

4. First aid treatment

Treatment of internal cell materials, such as electrolyte leaked from products are as follows.

Skin contact:	Clean with soap and rinse with a large amount of water immediately.
Eye contact:	Avoid rubbing eyes. Immediately flush with running water for at least 15 minutes. And then seek medical attention immediately.
Inhalation:	Move to an area with fresh air. Make the victim blow his/her nose, gargle. Seek medical attention immediately, if necessary.
Ingestion:	Seek medical attention immediately.

5. Fire fighting measures

Suitable extinguishing media:	Use fire extinguisher media (gas, foam, or powder) or a fire extinguisher system.
Specific hazards:	Corrosive gas may be generated during fire extinction. When danger is anticipated, use an oxygen mask.
Specific methods of fire-fighting:	When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.
Prevention of secondary hazards:	In the event of fire, immediately remove combustible materials from the surroundings.
	In the event of neighboring fire, move the battery to a safe location immediately.

6. Accidental release measures

Internal cell materials, such as electrolyte leaked from products, are carefully dealt with according to the followings.

Personal precautions:	Wear protective goggle and rubber gloves, then wipe off with dry cloth. Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.
Prevention of secondary hazards:	Keep away from flame.
Environmental precautions:	Do not throw out into the environment.

7. Handling and storage

Handling:	Do not damage or remove the external tube. Never throw out batteries in a fire or expose to high temperatures.
	Do not soak batteries in water or seawater.
	Do not vibrate, bump, drop, or stack the containers, which can damage them.
	Never disassemble, modify or deform.
	Do not connect the positive terminal to the negative terminal with electrically conductive material.
	In case of charging, use only dedicated charger.
Storage:	Keep away from flame.
	Do not let batteries get wet from rainwater or dew condensation.
	Do not store batteries in high temperature environments, such as under direct sunlight.

8. Toxicological information

There is no data available on the product itself. The information of the internal cell materials are as follows.

Lithium cobalt di-oxide ($LiCoO_2$):

- Acute toxicity:	Unknown.
- Sensitization:	The nervous system of respiratory organs may be stimulated sensitively.
- Chronic toxicity/ Long term toxicity:	By the inhalation of coarse particulate and steamy gas of cobalt, it is possible to cause the serious respiratory-organs disease. The person of allergy-natured or sensitive-natured may cause a skin reaction or a lung disease.
- Local effects(skin):	Although it is very rare, the rash of the skin and allergic erythema may result.

Graphite:

- Acute toxicity:	Unknown.
- Chronic toxicity/ Long term toxicity:	Since the prolonged inhalation under the high concentration of a graphite coarse particulate may become a cause of a lung disease or a tracheal disease, it is regulated by the coarse particulate obstacle prevention rule and the dust-lung method enforcement regulations.
- Carcinogenicity:	Graphite is not recognized as a cause of cancer by research organizations and natural toxic substance research organizations of cancer.

Electrolyte:

- Acute toxicity:	As the electrolyte is composed of several ingredients, the exact toxicity cannot be indicated. However, the toxicity of the major ingredients is shown below. Routes of entry: Oral (rat), LD50 : 2,000mg/kg or more
- Chronic toxicity/ Long term toxicity:	Exposure to the electrolyte for a long period of time may cause liver or kidney malfunctions.

9. Disposal considerations

Products:	Do not throw out the used battery. Recycle it through the recycling company.
Contaminated packaging:	Neither the container nor packing is contaminated during normal use. When internal materials leaked from the battery contaminates, dispose as industrial wastes subject to special control.

10. Transport considerations

Do not expose to high temperatures or dew condensation during mass transport by ship, truck, or railroad.

Avoid transport that could cause the collapse of cargo piles or damage to containers.

The container must be handled carefully.

Do not give shocks that result in the mark of hitting on the battery.

Do not soak the battery by the rain.